Statement of

General Motors Corporation

Submitted to the

Subcommittee on Telecommunications,

Trade, and Consumer Protection

Committee on Commerce

U.S. House of Representatives

April 28, 1997

I am Robert C. Lange, engineering director of General Motors North American Operations (NAO) Vehicle Development, which includes GM's Safety Center.

General Motors appreciates the opportunity to provide comments on air bag safety, safety belt use, and child safety seats -- issues of great importance to our customers, to you, to the American people, and to our company. Effectively protecting occupants is a fundamental element in motor vehicle design. We commend you and your colleagues for the attention you are calling to important policy issues and for helping to educate the American public on the facts of motor vehicle safety and air bags.

In considering any issue regarding motor vehicle safety, it is important to first understand the basic physics of a collision event. A motor vehicle traveling at common traffic speeds is a device with a high level of kinetic energy. In a collision, that kinetic energy must be fully dissipated during a very brief period -- typically less than one-tenth of a second, within which the vehicle's speed must be reduced to zero. The safety challenge is to dissipate that energy in ways that minimize the risk to occupants. This is partially achieved through deformation of the vehicle's structure in a crash.

The same dynamic principles apply to an occupant of a motor vehicle involved in a crash. As with the vehicle, the speed of an occupant must be reduced from the original travel speed to zero in a very short time, and the occupant's kinetic energy must be completely dissipated. However, the human frame is not as tolerant or as easily repaired as is the structure of a car or truck. To keep the human frame from absorbing the full energy of the crash, manufacturers focus attention on restraint systems -- safety belts

and air bags. It is also important to note that air bags are designed as a supplemental device to the safety belt system. When used correctly and together, air bags and safety belts save lives and reduce injuries.

Depowering

GM commends the National Highway Traffic Safety Administration (NHTSA) for issuing a final rule to give manufacturers additional leeway in producing less powerful air bags. The amended test procedure that NHTSA has approved will enable manufacturers to implement less powerful air bags in vehicles starting this year. However, the final rule permitting depowered air bags contains a "sunset" clause that prohibits manufacturers from producing vehicles with these less powerful air bags after September 1, 2001. GM strongly opposes this "sunset" clause. Including such a clause in the revised regulation presumes that more advanced technologies will offset any risks from more high-powered air bags and that depowered air bags would no longer be necessary in the restraint system equation. This is not the case.

The inflation characteristics that result from NHTSA's revised rule should be a permanent feature of any advanced air bag technology, unless new, less powerful air bags are shown to be demonstrably inferior to those more powerful bags which the industry is now abandoning. More advanced air bag technologies may provide some incremental improvements in safety, but they are not anticipated, by themselves, to fully mitigate the risks of air bag inflation-induced injury.

NHTSA should issue rulemaking to rescind the “sunset” clause and adopt depowered air bags as a permanent element of air bag technology. In addition, because design and engineering on vehicles scheduled for introduction in 2001 is already well along, GM asks that NHTSA act to rescind the “sunset” clause of the revised rule as soon as possible.

Air Bag Deactivation

The NHTSA has proposed a rule to permit any vehicle owners to have air bag systems deactivated. GM cannot support any proposal that promotes the widespread deactivation of air bags, because that would reduce overall safety. And for the same reason, GM cannot support proposals that would permit permanent deactivation of air bags. Instead, GM recommends that air bag deactivation be allowed only in the rare circumstances that are consistent with motor vehicle safety, after NHTSA approval, and only through the installation of retrofit manual cutoff switches. We take this position for several reasons.

- Air bags provide a net safety benefit for nearly all occupants. Further, proper restraint use (belts and/or appropriate child safety seats) would have prevented nearly all of the air bag-related fatal injuries of which NHTSA is now aware. Air bags save lives when all restraint systems -- safety belts and child safety seats -- are used properly.

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x When a motor vehicle driver uses a safety belt alone without an air bag, using the safety belt reduces that driver's risk of fatality in a crash by 42%. When the driver uses the safety belt in combination with an air bag, the driver's risk of fatality in a crash is reduced by 47%, which is a significant 9% improvement over the use of safety belts alone. For drivers who refuse to wear safety belts (even though belt use is required in every state but one), the air bag alone will reduce the risk of fatality in a crash by only 13%; however, when one looks at frontal crashes only, NHTSA estimates that air bags alone reduce the risk of fatality by 30%. Clearly, proper safety belt and air bag use together result in maximum restraint system performance and optimum protection for occupants. Increasing safety belt use is a superior solution to the risks of air bag injury than is widespread, permanent disconnection of air bags.

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• Lap/shoulder belts and air bags are designed as a system. They do not provide redundant protections. If an air bag is deactivated, its absence will result in reduced occupant protection. With some safety belt designs, absence of an air bag will substantially reduce safety belt effectiveness and the energy absorbing features of such systems.

In very rare cases, air bag deactivation is appropriate. In those cases, it should be permitted only through the installation of retrofit manual cutoff switches with a warning indicator visible to the appropriate vehicle occupants when the air bag is turned off. This would permit individuals to make informed decisions regarding activation or deactivation of the air bag. Current and future vehicle owners and occupants would know

immediately from the indicator if the air bag is activated. A manual cutoff switch would meet consumer demands through the deliberate selection of air bag enable/disable status, because subsequent drivers or owners would be able to easily reverse the disconnect decision by setting the switch position to "on."

GM believes that the NHTSA should remain actively involved in the approval of requests to deactivate air bags. Judgments about who should be allowed to deactivate their air bags should continue to be made by NHTSA, and the process and recordkeeping should remain in the agency's control.

Belt Use

All levels of government -- in fact, all elements of American society -- need to be committed to increase safety belt and proper child safety seat use rates. President Clinton's "National Strategy to Increase Safety Belt Use" is an excellent step in moving toward a goal that all Americans properly use safety belts and child safety seats. The plan sets a national goal of 85% safety belt usage by the year 2000 and 90% by 2005. The government estimates that meeting the 85% goal would prevent an estimated 4,194 fatalities and 102,518 injuries; meeting the 90% goal would save 5,536 lives and prevent 132,670 injuries. Through effective laws, enforcement, and public education about those laws and enforcement, the President's plan can help the U.S. reach the world-class levels of belt use that Canada, Australia, and some European countries have achieved.

About a year ago, the auto manufacturers, NHTSA, restraint system suppliers, the insurance industry, and others established the "Air Bag Safety Campaign." The Campaign has three objectives:

1. education regarding the risks of air bags and proper restraint system use;
2. enactment of standard, or "primary," enforcement laws governing safety belt and child safety seat use; and
3. effective enforcement of restraint system laws.

The Campaign can serve as an effective model for improving motor vehicle safety in support of President Clinton's targets.

To date, the Campaign has contributed to a higher level of awareness as to how air bags work and the importance of restraint use. Since the start of its initiatives, Maryland and the District of Columbia have passed legislation to strengthen restraint system laws; Oklahoma is almost there; Virginia has upgraded its child passenger safety law; and several other states are considering upgrades to their restraint laws.

Effective laws require standard, or "primary" enforcement with associated penalty points and high fines imposed for violations. Enactment of stronger laws and stronger enforcement of these laws will provide the incentive to drivers and other occupants to properly buckle themselves and to properly restrain their children. The Campaign has commitments from the state police agencies in all 50 states for high visibility enforcement through Operation ABC during Buckle-Up America Week, May 19-26, 1997.

GM has other initiatives underway that support the principles of the Campaign. GM has established a partnership with the “National SAFE KIDS Campaign” to increase and improve proper restraint use for children. Each partner will use its strengths -- SAFE KIDS’ extensive volunteer base of more than 200 coalitions and expertise are joining GM dealerships throughout the U.S. -- to promote correct child safety seat and safety belt usage and to reduce the number of motor vehicle occupant-related deaths and injuries among children. A pilot program held on a rainy Saturday with SAFE KIDS at a Baltimore-area GM dealership attracted families seeking assistance on correctly using their child safety seats. This pilot led to the establishment of the SAFE KIDS-GM partnership.

In addition to its work through dealerships, the SAFE KIDS-GM partnership will include an extensive media outreach program with messages directed to parents and caregivers about common errors in car seat use and installation and will offer toll-free numbers for additional materials. To further expand its reach to families, the partnership also is working with physicians, children’s hospitals, and other health care and educational organizations.

Caregivers clearly need good information. We want to help provide it to them directly through the SAFE KIDS-GM partnership.

For many years, GM has produced and distributed hundreds of thousands of booklets, brochures, and videotapes on safe driving practices and proper restraint use for all vehicle occupants, including children and pregnant women. GM led the auto

industry in providing our customers with an owner's manual that uses easily understandable language to precisely explain restraint system risks, proper restraint system use for children and adults, and many safe driving practices.

Our most recent education initiative is *"Precious Cargo"* -- a booklet and videotape, directed at adults, on the proper way to use child restraints and on proper placement of children in cars and trucks. The booklet and video are available free at every GM dealership in the U.S. or through an "800" phone call to any GM marketing division Customer Assistance Center. The booklet is available in English and will soon be available in Spanish. We have distributed over 800,000 copies of the booklet in less than two months to health care facilities, government and law enforcement agencies, and grassroots organizations throughout the country. This activity represents only the beginning of our distribution efforts.

Uniform Child Restraint Anchorage

Research indicates that while most adults know the importance of restraining children in a motor vehicle, some fail to properly secure child safety seats, fail to buckle children into the safety seats, or buckle them incorrectly, citing confusion over child seat and safety belt configurations.

In response to one of the recommendations of a blue ribbon panel on child seat and vehicle compatibility, GM led a coalition of auto industry, child safety seat

manufacturers, restraint system suppliers, and others in the child safety area to research and recommend an anchorage system for child safety seats.

In a joint petition to the NHTSA, the member companies of domestic and import auto associations proposed a three-point system: two "soft" anchorage points to be installed near the intersection of the seat cushion and seat back, and an upper "tether" anchorage. In the petition, the companies stated that tests of the proposed "Uniform Child Restraint Anchorage" (UCRA) significantly reduce dummy "head excursion measurements, which most developers and evaluators use as the primary predictor of a [child restraint system's] performance" in field crashes. More importantly, the proposed UCRA was strongly preferred by consumers for its practicality; usability; and low mass, bulk, and cost. It had the additional advantage of using buckle/latchplate hardware with which consumers are already familiar. Not only would the proposed UCRA help improve restraint use rates in the U.S., the system would be ideal to meet the needs of an international system, consistent with the Administration's and the auto industry's efforts to seek harmonization of international regulations.

Advanced Technology

Currently, much discussion focuses on the development of future technologies to help further reduce the risks of air bags. Advanced air bag technology research and implementation must proceed in a manner that maximizes the benefits to all motor vehicle occupants. Therefore, we must first focus on defining the current problems and then work on development of potential solutions. In this effort, our first priority should be

protection of the restrained occupant while minimizing potential harm to children and diminutive adults, and second to provide good protection for unrestrained adults.

Manufacturers and suppliers independently and in joint programs are working to define and develop appropriate countermeasures to air bag risks. Auto manufacturers also are actively participating in industry research initiatives through the American Automobile Manufacturers Association (AAMA) with the Jet Propulsion Laboratory and the NHTSA to assess advanced restraint systems now under development.

There are no advanced air bag systems available today that accurately, consistently, and reliably address air bag risks. Therefore, GM believes that it is inappropriate to mandate technological solutions with specific deadlines, especially when these technologies are not yet available, and there is no confidence in their function, reliability, durability, or efficacy. Doing so could result in a situation similar to that which we are currently facing with air bags, wherein the unintended consequences of a technology are causing a re-evaluation of the rule which bred that technology.

What can Congress do?

Congress can provide assistance to help reduce the risks of air bags.

First, to better identify areas for air bag improvement, manufacturers need statistically valid data on the field performance of air bags and their interaction with

vehicle occupants. Congress can provide assistance to the NHTSA to collect and distribute real world data that will help make future design assessments.

Second, U.S. regulations historically have required manufacturers to design an air bag system to protect an unbelted adult male in a very severe crash. This means that manufacturers have not been free to optimize the design of vehicles to enhance the safety of the majority of the population, who are properly using safety belts. This standard was established when the national safety belt use rate was below 15%. Now, virtually all states have laws requiring safety belt use, and the NHTSA estimates that the national belt use rate is around 68%.

It would now seem to be appropriate to revise the occupant protection rule to focus on protection for belted occupants while minimizing the risk to children and small adults, and still providing reasonable protection to unbelted occupants. To address this issue, the NHTSA has said that it believes that Congress should take action, since Congress mandated air bags. Since the NHTSA believes that they lack the authority to proceed in such a manner, Congress can encourage the NHTSA to reconsider its regulatory philosophy regarding standards addressing “belted” versus “unbelted” requirements.

Laws: Enactment, Enforcement, and Education

Finally, I would like to conclude our comments with the most significant elements of air bag safety -- Congress can use its leadership to support: (1) enactment of standard adult restraint use laws, (2) effective enforcement, and (3) consumer education of the importance of proper restraint system use. Properly using restraint systems continues to be the most effective way to reduce the frequency of death and serious injury in vehicle crashes. The Air Bag Safety Campaign has clearly articulated the important messages for the public:

- Children 12 and under should ride buckled up in a rear seat.
- Infants in rear facing child safety seats should NEVER ride in the front seat of a vehicle with a passenger side air bag.
- Small children should ride in a rear seat, in a child safety seat approved for their age and size.
- Check the vehicle owner's manual and the instructions provided with the child safety seat for correct use information.
- Everyone should buckle up with both lap AND shoulder belts on every trip.
- Driver and front passenger seats should be moved as far back as practical.

It bears repeating that nearly all fatalities attributed to air bags resulted from occupants who were either unrestrained, improperly restrained, or were out-of-position. A very few others died due to extenuating circumstances. Since some in the media have misrepresented the risks and benefits of air bags and restraint systems, Congress can

effectively use these hearings to assure that the American public has the facts about motor vehicle restraint systems and their proper use.

We encourage the Congress to review and provide support for the President's restraint use goals and the plan to meet them. Support for policies that require proper restraint use for government employees communicates a strong message not only to the hundreds of thousands of government employees but also to employers and employees in all workplaces. Also, the President's proposal to establish programs on Department of Defense sites and at National Park locations, in which motor vehicles are funneled through controlled access points, will help bring the restraint use message to additional millions of people. For our part, GM has committed to strive for 100% proper restraint use among all of our hundreds of thousands of employees.

Let me conclude my comments for this hearing on air bags with the important message stated precisely by the Air Bag Safety Campaign. It is: "A -- B -- C. Air Bag Safety: Buckle Everyone! Children in Back!"

Thank you. I would be glad to answer your questions.

- Metal-forming manufacturing processes, automotive products manufacturing and assembly processes, program planning and control procedures for new products, and new manufacturing or assembly processes

Robert C. Lange
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Robert C. Lange was appointed NAO Engineering Director for Vehicle Development Methodology and Laboratories on July 1, 1995.

The functional activities within this area of vehicle development are all focused upon the in-service performance of GM motor vehicle products and real-world customers' experiences with those products. In this assignment, Lange has managerial responsibility for the Safety & Restraints Center; Product Analysis and Investigations; Noise and Vibration Center; Energy Center; Systems Engineering; and Materials and Fastening.

Lange moved into his current position from an assignment as executive-in-charge of Field Performance Analysis which has responsibility for investigations and analysis in relation to product litigation, product claims and defect allegations.

Lange joined General Motors in February 1994 following a 12-year career with Failure Analysis Associates (FaAA), an engineering consulting firm. A vice president of FaAA since 1985, Lange's research and consulting activities were in the field of motor vehicle safety. Prior to joining Failure Analysis Associates, Lange held a variety of design engineering positions at Ford Motor Company, principally involving chassis, steering and controls and fuel and exhaust systems.

Born on October 3, 1947, in Detroit, Lange is a lifelong resident of Southeastern Michigan and earned bachelor and master of science degrees in mechanical engineering from the University of Michigan.

Lange has written extensively concerning motor vehicle safety. His research topics included occupant restraint system design and performance, fuel system design, vehicle structures, vehicle size and safety, accident risk analysis and brake systems. He is a member of the Engineering Society of Detroit and the Society of Automotive Engineers.

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July 1995